

TO19 DATA VERIFICATION SUMMARY REPORT
for samples collected from
CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

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INTRODUCTION

The following data verification summary report covers soil and rock samples collected from Camp Stanley Storage Activity (CSSA) under Task Order 0019 on February 26, 2004. The samples in the following Sample Delivery Group (SDG) were analyzed for semivolatile organic compounds (SVOCs) and metals:

43855

The field quality control (QC) samples collected in association with this SDG included one matrix spike/matrix spike duplicate (MS/MSD), and three field duplicates. No ambient blanks were collected. During the initiation of this project, it was determined that ambient blanks were not necessary due to the absence of a source at these sites.

All samples were collected by Parsons and analyzed by APPL Inc. following the procedures outlined in the Statement of Work and CSSA QAPP, version 1.0. The cooler associated with this SDG was received by the laboratory at a temperature of 3.0⁰ C which is within the 2-6⁰ C range recommended by the QAPP.

The samples in this SDG consisted of two matrices, rock and soil. All samples from B11 were soil in matrix. All samples from B12 were rock in matrix. The samples were divided into these two matrix groups for the purposes of flagging.

It should be noted that several additional analyses for sample B11-SW02 were included on the chain-of-custody (COC) by mistake. The unnecessary analyses have been crossed off the COC and removed from the report.

EVALUATION CRITERIA

The data submitted by the laboratory has been reviewed and verified following the guidelines outlined in the CSSA QAPP, version 1.0. Information reviewed in the data packages included sample results; field and laboratory quality control results; calibrations; case narratives; raw data; and COC forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the CSSA QAPP, version 1.0, were met.

SEMIVOLATILES

General

The SVOC portion of this SDG consisted of eleven (11) samples, including eight (8) environmental rock samples, one MS/MSD pair, and one field duplicate (FD). Only the samples collected from B12 required SVOC analysis. The samples were collected on February 26, 2004 and were analyzed for fluoranthene only. The SVOC analyses were performed according to the United States Environmental Protection Agency (USEPA) SW846 Method 8270C.

All samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control spike (LCS) samples, the MS/MSD samples, and the surrogate spikes. The rock sample B12-SW05 was designated for MS/MSD analysis on the COC.

The LCS recovery for fluoranthene was within acceptance criteria.

The MS/MSD recoveries for fluoranthene were within acceptance criteria.

All surrogate spike recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD samples and field duplicate samples. Sample B12-SW06 was collected in duplicate. The second sample from this location was submitted and analyzed as a field duplicate.

The MS/MSD RPD was within acceptance criteria.

Fluoranthene was below the RL in both the parent and field duplicate sample, so the RPD calculation was not applicable.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All instrument tune criteria were met.

- All initial calibration criteria were met.
- All second source verification criteria were met. The LCS was analyzed using a secondary source.
- All calibration verification criteria were met.
- All internal standard criteria were met.
- All manual integrations were reviewed and approved.

One method blank was analyzed in association with the SVOC analyses in this SDG. The method blank was free of fluoranthene at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All SVOC results for the samples in this SDG were considered usable. The completeness of the SVOC portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

ICP METALS

General

The ICP metals portion of this SDG consisted of twenty (20) samples, including fifteen environmental soil and rock samples, one MS/MSD pair and three field duplicates. The samples were collected on February 26, 2004 and were analyzed for a reduced list of ICP metals. The samples collected from B11 required analysis for barium, chromium, nickel and zinc. The samples collected from B12 required analysis for barium, copper, nickel and zinc.

The ICP metals analyses were performed using USEPA SW846 Method 6010B. The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS and LCS Duplicate (LCSD) samples and the MS/MSD samples. Rock sample B12-SW05 was designated for MS/MSD analysis on the COC.

All LCS/LCSD recoveries were within acceptance criteria.

All MS/MSD recoveries were within acceptance criteria, except for the following:

Parent	Metal	MS %R	MSD %R	Criteria
B12-SW05	Barium	134	260	75-125%

The parent sample for this MS/MDS was rock in matrix, so all samples from B12 were flagged "M" for barium.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate samples. Samples B11-SW02, B11-SW08 and B12-SW06 were collected in duplicate. The second sample from each location was submitted and analyzed as a field duplicate.

All LCS/LCSD RPDs were within acceptance criteria.

All MS/MSD RPDs were within acceptance criteria, except for the following:

Parent	Metal	RPD	Criteria
B12-SW05	Copper	25.8	RPD \leq 20

The parent sample for this MS/MSD was rock in matrix, so all samples from B12 were flagged "J" for Copper.

For the FD pair on B11-SW02, all RPDs met criteria as follows:

Parent	Metal	FD RPD	Criteria
B11-SW02	Barium	2.0	RPD \leq 20
	Chromium	4.2	
	Nickel	0.08	
	Zinc	4.0	

For the FD pair analyzed on B11-SW08, all RPDs except zinc met criteria as follows:

Parent	Metal	FD RPD	Criteria
B11-SW08	Barium	17.4	RPD \leq 20
	Chromium	12.0	
	Nickel	18.3	
	Zinc	44.2	

All samples in this SDG were collected on February 26, 2004, so the zinc results for all samples were flagged "J" if detected.

For the FD pair analyzed on B12-SW06, all RPDs failed criteria as follows:

Parent	Metal	FD RPD	Criteria
B12-SW06	Barium	77.0	RPD \leq 20
	Copper	79.4	
	Nickel	46.8	
	Zinc	48.5	

The data was double checked to ensure the correct concentrations were reported for the parent and field duplicate samples. All samples in this SDG were collected on February 26, 2004, so all results for barium, copper, nickel and zinc were flagged "J" if detected above the RL unless the result was previously flagged "M". (The "M" flag supercedes the "J" flag in the CSSA QAPP flag hierarchy.)

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- All interference check criteria were met.
- A dilution test (DT) was analyzed on rock sample B12-SW06. The DT was not applicable for nickel because all sample results were less than 50x the MDL. The DT was applicable for barium, copper and zinc. The %D for these metals failed to meet criteria as follows:

Metal	%D	Criteria
Barium	17.4	%D ≤ 10
Copper	11.1	
Zinc	15.5	

All associated sample results for these metals were previously flagged either “M” or “J” due to the failing MS/MSD recoveries and/or field duplicate RPDs, so no additional corrective action was necessary.

- The laboratory also analyzed a post digestion spike (PDS) on sample B12-SW06. All PDS recoveries were within acceptance criteria.

One method blank and several calibration blanks were analyzed in association with the ICP analyses in this SDG. All blanks were free of target metals at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All ICP metals results for the samples in this SDG were considered usable. The completeness for the ICP metals portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

ARSENIC

General

The arsenic portion of this SDG consisted of nine (9) samples, including seven environmental soil samples and two field duplicates. The samples were collected on February 26, 2004 and were analyzed for arsenic using USEPA SW846 Method 7060A. Only the samples collected from B11 required analysis for arsenic.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted that all but two of the samples were analyzed at a dilution due to the high level of arsenic present.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples. No sample from B11 was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples and the field duplicate analyte results. Samples B11-SW02 and B11-SW08 were collected in duplicate. The second sample from this location was submitted and analyzed as a field duplicate.

The LCS/LCSD RPD was within acceptance criteria.

The field duplicate RPD's met criteria as follows:

Sample ID	Metal	FD RPD	Criteria
B11-SW02	Arsenic	14.0	RPD \leq 25
B11-SW08	Arsenic	8.8	RPD \leq 25

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met. There were three ICALs associated with the arsenic results in this SDG.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- The dilution test was analyzed on the field duplicate of soil sample B11-SW08. Arsenic failed criteria as follows:

Metal	%D	Criteria
Arsenic	23.4	%D ≤ 10

No MS/MSD was analyzed for the soil samples, so the arsenic results in all samples from B11 were flagged “M” in accordance with the CSSA QAPP.

- The laboratory also analyzed a PDS on sample B11-SW08. Arsenic failed to meet criteria in the PDS, as follows:

Metal	%R	Criteria
Arsenic	83.4	85-115%

No corrective action was necessary since all associated sample results were previously flagged “M” due to the failing DT.

One method blank and several calibration blanks were analyzed in association with the arsenic analyses in this SDG. All blanks were free of arsenic at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All arsenic results for the samples in this SDG were considered usable. The completeness for the arsenic portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

CADMIUM

General

The cadmium portion of this SDG consisted of nine (9) samples, including seven environmental soil samples and two field duplicates. The samples were collected on February 26, 2004 and were analyzed for cadmium using USEPA SW846 Method 7131A. Only the samples collected from B11 required analysis for cadmium.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted four samples required a dilution due to the high levels of cadmium present.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples. No sample was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples and the field duplicate analyte concentrations. Samples B11-SW02 and B11-SW08 were collected in duplicate. The second sample from each location was submitted and analyzed as a field duplicate.

The LCS/LCSD RPD was within acceptance criteria.

For the FD pair on B11-SW02, the RPD failed as follows:

Parent	Metal	FD RPD	Criteria
B11-SW02	Cadmium	56.5	RPD \leq 25

All samples in this SDG were collected on February 26, 2004, so the cadmium results for all samples were flagged "J" if detected

For the FD pair analyzed on B11-SW08, the RPD met criteria as follows:

Parent	Metal	FD RPD	Criteria
B11-SW08	Cadmium	12.2	RPD \leq 25

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.

- The dilution test was analyzed on sample B11-SW05. The DT met criteria with a %D of 8.3.
- The laboratory also analyzed a PDS on sample B11-SW05. Cadmium met criteria in the PDS with a recovery of 100.5%.

One method blank and several calibration blanks were analyzed in association with the cadmium analyses in this SDG. All blanks were free of cadmium at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All cadmium results for the samples in this SDG were considered usable. The completeness for the cadmium portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

LEAD

General

The lead portion of this SDG consisted of eleven (11) samples, including eight environmental rock samples, one MS/MSD pair and one field duplicate. The samples were collected on February 26, 2004 and were analyzed for lead using USEPA SW846 Method 7421. Only the samples collected from B12 required analysis for lead.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. The samples were prepared and analyzed within the holding time required by the method.

It should be noted six of the samples required a dilution due to the high levels of lead present.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples and MS/MSD samples. Rock sample B12-SW05 was designated for MS/MSD analysis on the COC.

Both LCS/LCSD recoveries were within acceptance criteria.

The MS/MSD recoveries failed to meet acceptance criteria as follows:

Parent	Metal	MS %R	MSD %R	Criteria
B12-SW05	Lead	2771	-8168	75-125%

The anomalous recoveries were due to the low spike amount relative to the parent sample concentration. The parent sample concentration was 309.6 mg/kg and the spike amount was less than one percent of that (2.5 mg/kg). All sample results for lead were flagged “M” in accordance with the CSSA QAPP.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte concentrations. Sample B12-SW06 was collected in duplicate. The second sample from this location was submitted and analyzed as a field duplicate.

The LCS/LCSD RPD was within acceptance criteria.

The MS/MSD RPD failed to meet criteria as follows:

Parent	Metal	RPD	Criteria
B12-SW05	Lead	113	$RPD \leq 25$

All associated sample results were previously flagged “M” due to the failing MS/MSD recoveries, so no additional corrective action was necessary.

For the FD pair analyzed on B12-SW06, the RPD met criteria as follows:

Parent	Metal	FD RPD	Criteria
B12-SW06	Lead	8.8	$RPD \leq 25$

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

- All initial calibration criteria were met.
- All initial and continuing calibration verification criteria were met.
- All second source calibration criteria were met. The ICV was prepared using a secondary source.
- The dilution test was analyzed on rock sample B12-SW05. The DT failed to meet criteria as follows:

Metal	%D	Criteria
Lead	12.4	$\%D \leq 10$

All associated sample results were previously flagged “M” due to the failing MS/MSD recoveries, so no additional corrective action was necessary.

- The laboratory also analyzed a PDS on sample B12-SW05. Lead failed to meet criteria in the PDS as follows:

Metal	%R	Criteria
Lead	-187.2	85-115%

The anomalous recovery was again due to the low spike concentration (2.6 mg/kg) relative to the parent concentration (290 mg/kg). All associated sample results were previously flagged “M” due to the failing MS/MSD recoveries, so no additional corrective action was necessary.

One method blank and several calibration blanks were analyzed in association with the lead analyses in this SDG. All blanks were free of lead at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All lead results for the samples in this SDG were considered usable. The completeness for the lead portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

MERCURY

General

The mercury portion of this SDG consisted of eleven (11) samples, including eight environmental rock samples, one MS/MSD pair and one field duplicate. The samples were collected on February 26, 2004 and were analyzed for mercury using USEPA SW846 Method 7471A. Only the samples collected from B12 required analysis for mercury.

The samples in this SDG were analyzed following the procedures outlined in the CSSA QAPP. All samples were prepared and analyzed within the holding time required by the method.

Accuracy

Accuracy was evaluated using the %R obtained from the LCS/LCSD samples and MS/MSD samples. Rock sample B12-SW05 was designated for MS/MSD analysis on the COC.

All LCS/LCSD and MS/MSD recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD samples, the MS/MSD samples, and the field duplicate analyte concentrations. Sample B12-SW06 was collected in duplicate. The second sample from this location was submitted and analyzed as a field duplicate.

The LCS/LCSD and MS/MSD RPDs were within acceptance criteria.

For the FD pair analyzed on B12-SW06, the RPD failed to meet criteria as follows:

Parent	Metal	FD RPD	Criteria
B12-SW06	Mercury	114.3	RPD \leq 25

All mercury results above the RL were flagged “J” due to the high FD RPD.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the CSSA QAPP;
- Comparing actual analytical procedures to those described in the CSSA QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the CSSA QAPP. The samples were prepared and analyzed within the holding times required by the method.

- All initial calibration criteria were met.
- All calibration verification criteria were met.
- All second source verification criteria were met. The ICV was prepared using a secondary source.

One method blank and several calibration blanks were analyzed in association with the mercury analyses in this SDG. All blanks were free of mercury at or above the RL.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All mercury results for the samples in this SDG were considered usable. The completeness for the mercury portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.